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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

REPORT OF PINE BEETLE SURVEYS ON THE WHITMAN NATIONAL FOREST SEASONS OF 1941 AND 1942

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March 1943

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Report of Pine Beetle Surveys

on the

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ABSTRACT

Basis

Data presented are from the seventh (1941) and eighth (1942) annual pine beetle surveys.

Status of Infestation

Although the general trend was upward in 1940 and 1941, infestation upon the forest remained within normal limits except for Susanville, Prairie City, Sumpter, Bridge Port, Burnt River, and Unity units where light epidemic losses occurred. A slight decrease of infestation during 1942 is indicated.

Estimated Forest Losses

Season of loss	No. of Trees	Volume B.B.M.	Board Ft. Per Acre	Percent of Stand
1940	23,779	14,853	19	0.31
1941	27,174	17,564	22	0.37

Recommendations

No direct control is necessary.

Indtroduction

The seventh and eighth annual pine beetle surveys of pinderosa pine stands within and adjacent to the Whitman National Forest were conducted during the periods October 27 to November 7, 1941, and October 13 to 24, 1942, respectively. These surveys are carried on as a cooperative project between the Forest and the Bureau of Entomology and Plant Quarantine.

The 1941 and 1942 surveys consisted of a 100 percent cruise of current beetle losses on semi-permanent, 320-acre check plots that have been established for a number of years. Eight plots were cruised in 1941. In 1942 survey funds were sufficient to cruise only six plots. Information secured on the 1941 survey served to complete the 1940 loss data. The 1942 survey completed the 1941 loss data and gave preliminary information on the 1942 infestation trend.

In addition to obtaining the usual loss records, the 1942 survey crew also made a 10 percent cruise of the green stand on the check plots. This green stand cruise was made by the $\frac{1}{5}$-acre, random, circular plot method in conjunction with the spotting. All ponderosa pines over 9.5 DBH on the $\frac{1}{5}$-acre plots were recorded by diameter and California risk class.

The survey crews were composed of the following men: In 1941- W. V. Masson, E. Sutherland and B. Fielder, and in 1942 - M. W. Watson, S. F. Elliott and W. J. Buckhorn. Mr. A. J. Jaenicke of the Forest Service trained and supervised the 1941 crew. The 1942 crew was trained and supervised by the writer.

During 1942 the writer observed the general infestation conditions over much of the Blue Mountain Division of the Forest. These general observations together with a comprehensive coverage of the entire forest in 1941 served as a guide in interpreting the check plot data in terms of losses for the forest as a whole.

Past Losses

The condition and relative abundance of snags and down logs indicated that the trend of infestation prior to inauguration of systematic surveys in 1935 had closely followed the trend of losses on other forest of the Blue Mountain Region having a longer series of plot records. In general the infestation began an upward trend during 1930 and rapidly developed into an epidemic that reached its greatest intensity in 1932. The upward trend was halted in the winter of 1932-33 by extreme subzero temperatures that caused wide spread mortality to overwintering broods of the pine beetle. The infestation then subsided until it reached a low point during 1936. Losses on the plots during that year averaged 48 board feet per acre or 0.54 percent of the stand. During 1937 and 1938 infestation increased. Losses during the latter year averaged 1.39 percent of the stand. This was but a temporary flare up, for losses declined to 0.60 percent of stand in 1939. The above described infestation trend is graphically shown in Figure 1.

Plot Losses 1940 - 1942

During 1940 the average loss on the plots increased 10 percent; however, trends on individual plots varied considerably. Losses on three plots, two on the Powder River area and one on the Sumpter area, increased, while on the other five plots, three on the Sumpter area, and one each on the John Day and Dale areas, the infestation either remained static or declined. The loss in 1940 averaged 55 board feet per acre or 0.67 percent of the stand.

During 1941 the infestation trend was upward on all except the Big Springs plot on the Dale area. Losses for the forest increased 33 percent but the infestation did not become aggressive. Losses during 1941 averaged 73 board feet per acre or 0.88 percent of the stand.

Past experience indicates that from 71 to 80 percent of the 1942 loss was perceptible at the time of the 1942 survey. These partial data indicate that a decrease of approximately 10 percent occurred during 1942.

Locations of the eight plots covered during the 1941 survey and the six plots covered during 1942 are shown in Figure 2. Individual plot data secured on these surveys are presented in Table 1. The infestation trend on the plots is graphically shown in Figure 1.

General Infestation Conditions 1940 - 1941

Although some increase occurred on the Powder River area and a portion of the Burnt River area, it was not sufficient to greatly alter the infestation status during 1940. Above normal infestation, rated as light epidemic, was present in small centers on six units, Suasnville, Prairie City, Sumpter, Bridgeport, Burnt River, and Unity. The latter two continue to support the heaviest and largest centers of light epidemic infestation. Elsewhere on the forest only a normal infestation existed.

During 1941 a general increase of infestation occurred over the entire forest. Existing centers of light epidemic infestation expanded to some extent, but no new centers of above normal infestation appeared. Although losses increased somewhat over the remainder of the forest, a normal infestation status continued to prevail. The infestation did not become sufficiently aggressive in any of the light epidemic centers to warrant direct control measures.

On the Unity Unit where infestation is relatively high and beetle hazard is great, current logging operations are gradually reducing the hazard through cutting.

Insect-caused ponderosa pine losses on the forest during the two year period, 1940 and 1941, are estimated at 32 million board feet. These estimated losses are presented by units and areas in Table 2. The intensity and distribution of the 1941 loss is graphically shown in Figure 2.

Recommendations

No direct control measures were necessary during 1940 and 1941. On the basis of a probable decrease of infestation during 1942, no direct control of the currently overwintering brood is recommended.

Table No. 1

Whitman — Insect Caused Ponderosa Pine Losses on Virgin Check Plots

Area And Units	Check Plots: Plot	Timbered Acreage	Pine Vol. Bd.Ft. as of Jan. 1940	1940 Losses: No. of Trees	Board Feet: Volume	Per Acre	% of Stand	Ratio to 1939	1941 Losses: No. of Trees	Board Feet: Volume	Per Acre	% of Stand	Ratio to 1940
DALE													
Dale	Big Springs	320	2,501,330	4	4,590	14	.18	.58	7	3,070	10	.12	.67
JOHN DAY													
Susanville	Susanville	320	2,188,210	20	10,780	34	.49	.90	29	18,640	58	.85	1.73
SUMPTER													
Unity	Tamarack Spr.	320	3,880,840	30	29,450	89	.76	.94	37	36,310	114	.94	1.24
Burnt River	Experiment Sta.	320	3,494,290	42	26,520	83	.76	1.79	31	27,940	87	.80	1.05
Sumpter	Smith Cr.	317	2,138,925	36	26,540	84	1.12	.97	49	32,670	103	1.15	1.23
Bridgeport	Auburn Cr.	320	2,911,150	17	15,600	47	.56	.90	28	19,950	62	.69	1.28
Area Total		1277	12,425,205	125	98,110	76	.77	1.06	145	116,870	91	.95	1.21
POWDER RIVER													
Eagle Cr.	Medical Spr.	320	2,095,245	17	17,670	55	.84	1.37	*25	26,470	83	1.26	1.50
	Sparta	320	1,723,135	13	10,210	32	.59	3.22	*20	20,330	64	1.18	1.99
Area Total		640	3,818,380	30	27,880	43	.73	1.72	45	46,800	73	1.23	1.68
FOREST TOTAL		2,557	20,933,125	179	141,360	55	.67	1.10	181	185,380	73	.88	1.33

* Plots not cruised in 1942. Estimate of total loss based on that portion of the season's loss marked on survey of 1941.

Table No. 2

Whitman — Insect Caused Ponderosa Pine Mortality

Area And Unit	Pine Type Acres Virgin	Acres Cutover	Acres Total	Total Volume M. B. M. Jan. 1, 1940	Estimated 1940 Loss Trees	Volume M.B.M.	Trees Per Sec.	Bd. Ft. Per Acre	Percent of Stand	Estimated 1941 Loss Trees	Volume M.B.M.	Trees Per Sec.	Bd.Ft. Per Acre	% of Stand
DALE														
Dale	89,600	—	89,600	575,200	2,700	1,800	19	20	.31	3,160	2,100	23	23	.37
Northfork	40,720	—	40,720	203,100	760	500	12	12	.25	910	610	14	15	.30
Granite	19,800	—	19,800	177,200	121	80	4	4	.05	148	89	4	4	.05
Area Total	150,120	—	150,120	9,555,500	3,581	2,380	15	16	.25	4,218	2,799	18	19	.29
JOHN DAY														
Susanville	71,470	1,980	73,450	557,300	1,437	836	12	11	.15	2,140	1,273	19	24	.24
Austin	11,720	56,280	68,000	169,100	270	82	3	1	.05	230	94	2	1	.06
Prairie City	61,110	4,680	65,790	308,200	2,705	1,540	26	23	.50	3,025	1,726	30	26	.56
Area Total	144,510	62,940	207,240	1,030,600	4,412	2,458	14	12	.24	5,395	3,093	17	15	.31
LA GRANDE														
Starkey	18,180	8,960	27,140	329,900	240	130	6	5	.04	276	159	7	6	.05
LaGrande	4,160	14,080	18,240	50,300	300	162	10	9	.32	327	186	11	10	.37
Area Total	22,340	23,040	45,380	380,200	540	292	8	6	.08	603	345	9	8	.09
SUMPTER														
North Powder	6,110	12,020	18,030	92,600	450	90	16	5	.10	510	102	18	6	.11
Pocahontas	5,460	9,840	15,300	24,400	240	48	10	3	.20	300	60	13	4	.25
Sumpter	11,920	40,580	52,500	200,800	1,547	770	19	15	.39	1,665	1,000	20	19	.50
Whitney	9,080	28,400	37,480	256,800	533	250	9	7	.10	638	382	11	10	.15
Burnt River	34,300	5,800	40,100	381,000	5,000	3,580	80	87	.92	5,310	3,700	85	93	.97
Bridge Port	38,710	16,640	55,350	371,900	2,940	1,800	34	32	.49	3,400	2,210	39	49	.60
Unity	21,240	3,000	24,240	426,100	1,515	1,065	40	44	.25	1,675	1,340	44	55	.33
Area Total	126,720	116,280	243,000	1,753,600	12,225	7,523	32	31	.43	13,498	8,794	35	36	.50

Table No. 2

Whitman — Insect Caused Ponderosa Pine Mortality

Area and Unit	Pine Type Acres			Total Volume M. B. M. Jan. 1, 1940	Estimated 1940 Loss					Estimated 1941 Loss				
	Virgin	Cutover	Total		Trees	Volume M.B.M.	Trees Per Sec.	Bd.Ft. Per Acre	Percent of Stand	Trees	Volume M.B.M.	Trees Per Sec.	Bd.Ft. Per Acre	% of Stand
GRANDE RONDE														
Mt. Harris	3,320	14,240	17,560	48,100	139	55	5	3	.12	160	64	6	4	.13
Wilson River	4,480	---	4,480	18,800	52	29	7	6	.15	67	37	10	8	.20
Union	5,590	23,130	28,720	53,530	510	204	11	7	.39	543	217	12	8	.42
Area Total	13,390	37,370	50,760	120,430	701	288	9	6	.24	770	318	10	6	.26
POWDER RIVER														
Eagle Cr.	31,250	37,760	69,010	343,100	1,910	1,623	18	23	.47	2,200	1,870	20	27	.55
Pine Cr.	26,750	2,320	29,070	162,700	372	264	8	9	.16	450	319	10	11	.20
Lookout Mt.	1,920	---	1,920	19,100	38	25	13	13	.13	40	26	13	14	.14
Area Total	59,920	40,080	100,000	524,900	2,320	1,912	15	19	.36	2,690	2,215	17	22	.42
FOREST TOTAL	507,000	279,710	796,710	4,765,230	23,779	14,853	19	19	.31	27,174	17,564	22	22	.37

Figure No. 1

TREND OF CHECK PLOT LOSSES

FRITZEN NATIONAL FOREST

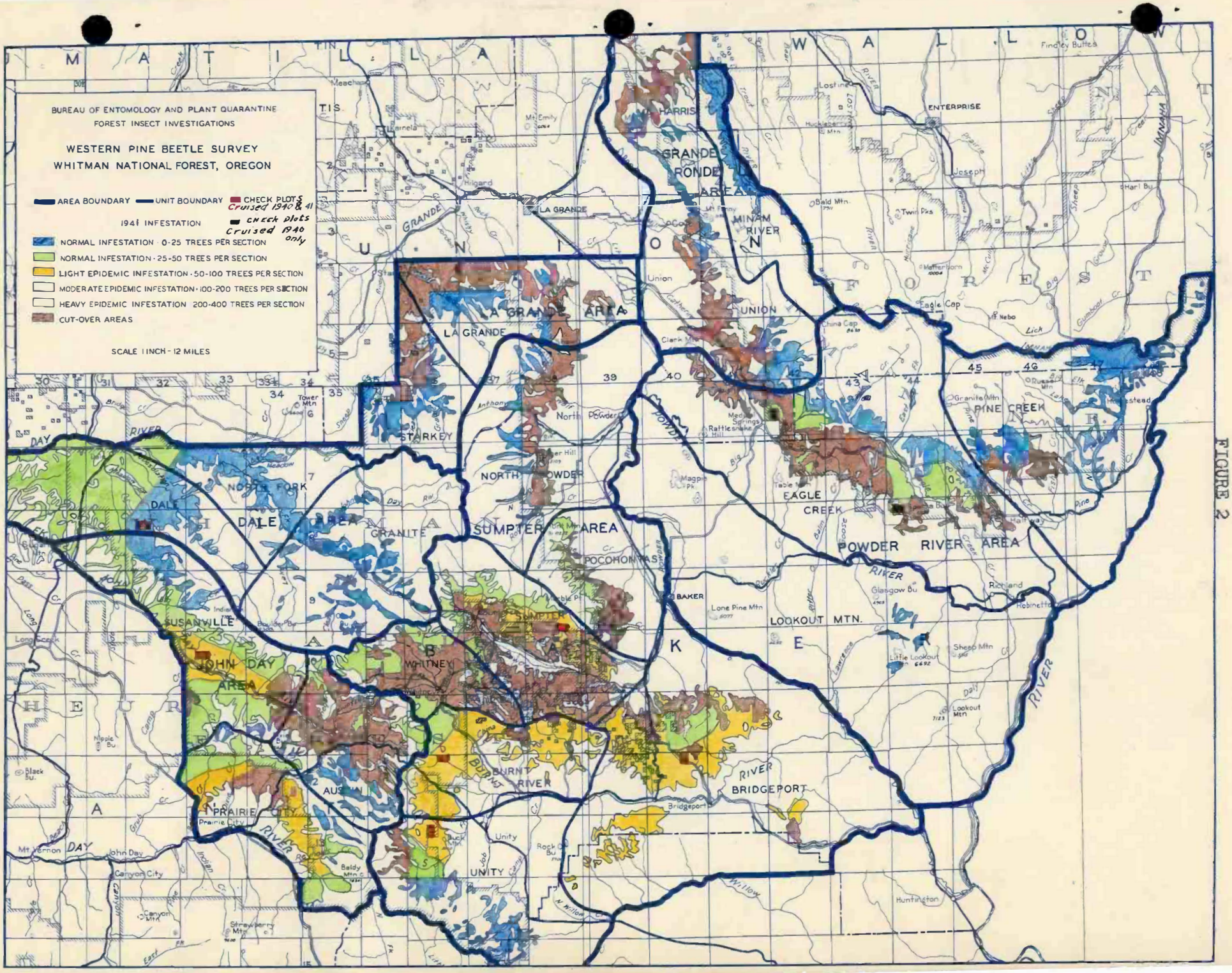
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS
WESTERN PINE BEETLE SURVEY
WHITMAN NATIONAL FOREST, OREGON
AREA BOUNDARY
UNIT BOUNDARY
CHECK PLOTS Cruised 1940 & 41
check plots Cruised 1940 only
1941 INFESTATION
NORMAL INFESTATION · 0-25 TREES PER SECTION
NORMAL INFESTATION · 25-50 TREES PER SECTION
LIGHT EPIDEMIC INFESTATION · 50-100 TREES PER SECTION
MODERATE EPIDEMIC INFESTATION · 100-200 TREES PER SECTION
HEAVY EPIDEMIC INFESTATION 200-400 TREES PER SECTION
CUT-OVER AREAS
SCALE 1 INCH - 12 MILES
GRANDE RONDE AREA
LA GRANDE AREA
SUMPTER AREA
POWDER RIVER AREA
DALE AREA
JOHN DAY AREA
BAKER
UNION
ENTERPRISE
LA GRANDE
STARKEY
NORTH POWDER
EAGLE CREEK
PINE CREEK
SUSANVILLE
WHITNEY
GRANITE
POCOHONTAS
LOOKOUT MTN.
BRIDGEPORT
PRAIRIE CITY
UNITY
AUSTIN
HARRIS
MINAM RIVER
NORTH FORK
BURNT RIVER
POWDER RIVER
GRANDE RONDE RIVER
WALLOWA
WHITMAN NATIONAL FOREST

FIGURE 2